

Electronic Supplementary material

A bright yellow light from Yb³⁺,Er³⁺-codoped Y₂SiO₅ upconversion luminescence material

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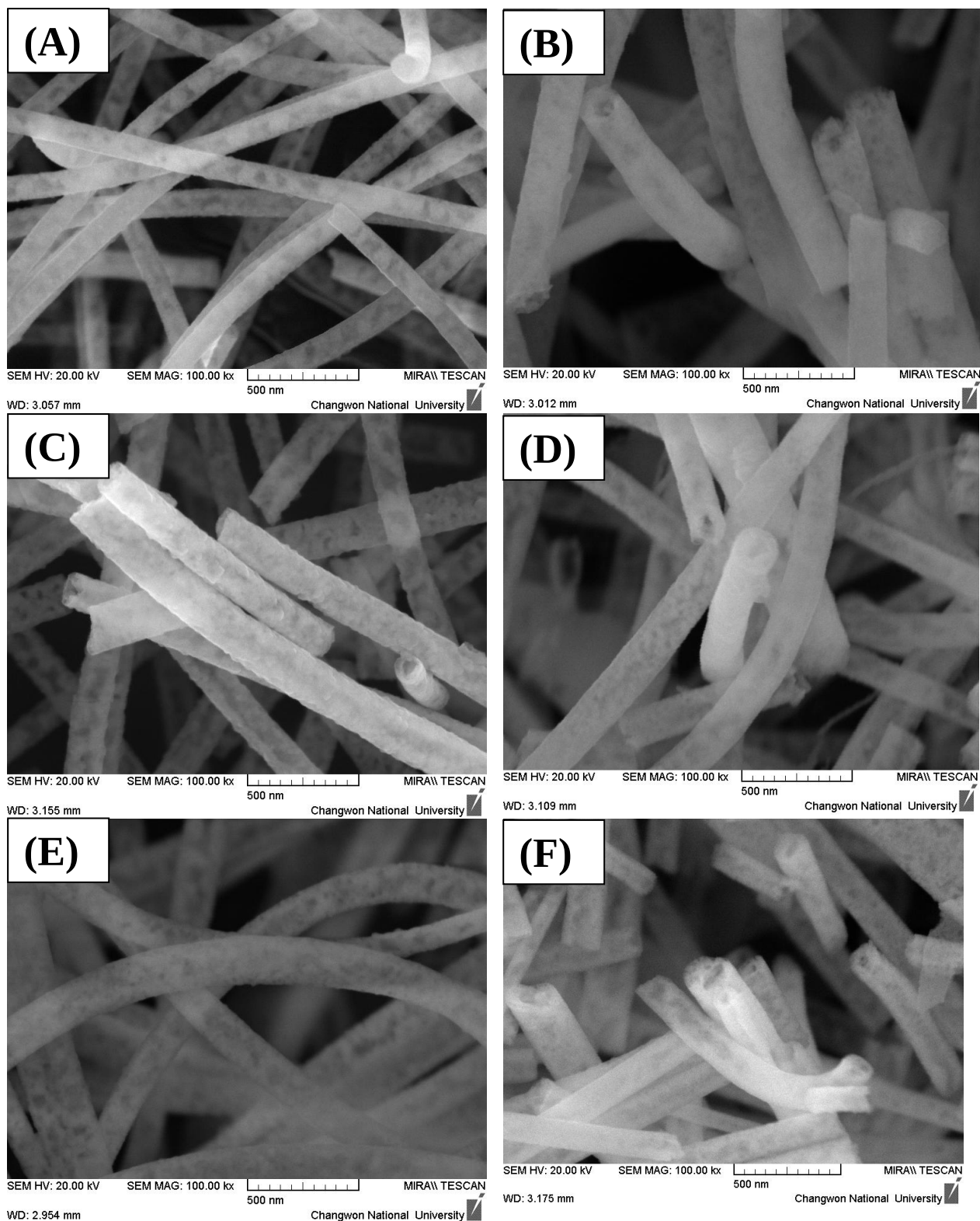


Figure S1: SEM images of the YSO:YbEr fibers, which were prepared at 15 kV (a), 20 kV (b), 25 kV (c) with the distance between spinneret and collector of 18 cm. The dependence of the length fiber on the distance between spinneret and collector of 11 cm (d), 18 cm (e), and 25 cm (f) at 20 kV.

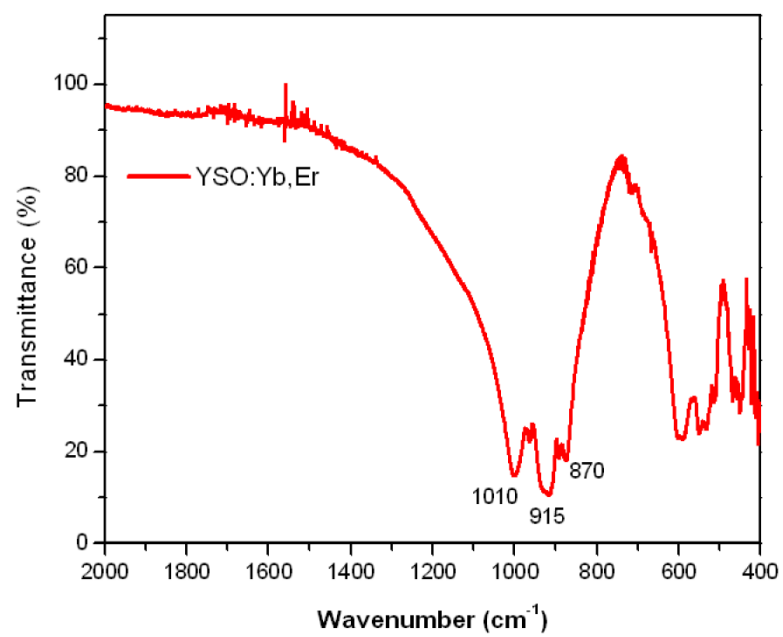


Figure S2. The FT-IR spectra of YSO and YSO:Yb,Er-1400 samples

Table S1: Calculated radiative transition probability, branch ratio, experimental and calculated decay time of the levels $^4F_{9/2}$, $^4S_{3/2}$ and $^2H_{11/2}$

Transition	ν (cm ⁻¹)	A_{ed}	β (%)	τ (μ s)
$^4F_{9/2} \rightarrow$	$^4I_{9/2}$	2850	1.9	0.07
	$^4I_{11/2}$	5000	21.3	0.86
	$^4I_{13/2}$	8650	489	19.8
	$^4I_{15/2}$	15250	1956	79.3
		$A_t = 2468 \text{ s}^{-1}$		
$^4S_{3/2} \rightarrow$	$^4F_{9/2}$	3100	1.8	0.03
	$^4I_{9/2}$	5950	148	2.77
	$^4I_{11/2}$	8100	110	2.05
	$^4I_{13/2}$	11750	1470	27.5
	$^4I_{15/2}$	18350	3630	67.7
		$A_t = 5360 \text{ s}^{-1}$		
$^2H_{11/2} \rightarrow$	$^4S_{3/2}$	800	0.03	0.00
	$^4F_{9/2}$	3900	10.32	0.26
	$^4I_{9/2}$	6750	109	2.76
	$^4I_{11/2}$	8900	64.63	1.64
	$^4I_{13/2}$	12550	146	3.70
	$^4I_{15/2}$	19042	3610	91.60
		$A_t = 3940 \text{ s}^{-1}$		

Table S2: The CIE chromaticity co-ordinates (x,y) calculated from emission spectra.

Sample		X	Y
Fixed Yb ³⁺ - 18 % mol	Er ³⁺ 0.5 % mol	0.360217	0.396664
	Er ³⁺ 1.0 % mol	0.354784	0.370219
	Er ³⁺ 2.0 % mol	0.354784	0.370219
	Er ³⁺ 3.0 % mol	0.376826	0.409269
Fixed Er ³⁺ - 2 % mol	Yb ³⁺ 5 % mol	0.351415	0.358579
	Yb ³⁺ 10 % mol	0.341334	0.370991
	Yb ³⁺ 18 % mol	0.341431	0.355306
	Yb ³⁺ 23 % mol	0.343048	0.349663
	Yb ³⁺ 27 % mol	0.346102	0.356683
		0.342907	0.35511
Yb-18% mol-Er-2 % mol		0.352706	0.377406
		0.36251	0.396727
	Change of pump power	0.367912	0.40726
		0.371549	0.419952
		0.373585	0.418647
		0.378545	0.436607
		0.382384	0.446803